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EXAMINER	
POKRZYWA, JOSEPH R	
ART UNIT	**PAPER NUMBER**
2622	10

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No.	Applicant(s)	
	09/196,689	KULKARNI, MANISH	
	Examiner	Art Unit	
	Joseph R. Pokrzywa	2622	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 6 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 06 February 2002 .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-30 is/are pending in the application.

4a) Of the above claim(s) ______ is/are withdrawn from consideration.

5)☐ Claim(s) ______ is/are allowed.

6)☒ Claim(s) 1-30 is/are rejected.

7)☐ Claim(s) ______ is/are objected to.

8)☐ Claim(s) ______ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on ______ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on ______ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. ______ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ______ .
4) ☐ Interview Summary (PTO-413) Paper No(s). ______ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. Applicant's amendment was received on 2/6/02, and has been entered and made of record. Currently, ***claims 1 through 30*** are pending.

Response to Arguments

2. Applicant's arguments filed 2/6/02 have been fully considered but they are not persuasive.

3. In response to applicant's arguments regarding ***claim 1***, which was rejected under 35 U.S.C. 102(e), as being anticipated by Wan *et al.* (U.S. Patent Number 5,721,572), which state on page 17, that Wan fails to teach of generating a reverse model LUT in a manner set forth in claim 1, since Wan expressly states that it is not generating an ILUT. The examiner disagrees with this statement, and notes that as seen in Fig. 3, and in column 4, lines 15 through 17, Wan states "[t]he inverse look-up table 40 is created using the look-up table 36 and a gamut descriptor 38 for the second device 24." This section shows that the gamut descriptors are used *for generating the ILUT*. Further, the section of Wan cited by the applicant, which references an abandoned application for a more detailed description of how the gamut descriptors are used to efficiently create the ILUT, is not expressly stating that an ILUT is not generated for the instant case, as argued by applicant, but simply refers where to find extra information on how the ILUT is efficiently created.

4. Continuing, applicant argues on pages 17 through 20 that Wan'572 is merely seen to describe the generation of gamut descriptors, which are not the same as generating an inverse look-up table, thereby failing to teach of generating a reverse model LUT.

The examiner agrees with applicant, in that Wan teaches of generating gamut descriptors, whereby the gamut descriptors are not the same as an inverse look-up table. However, Wan teaches that the gamut descriptors are used to generate the inverse look-up table. As noted above, Wan states in column 4, lines 8 through 17 that the "inverse look-up table 40 is created using the look-up table 36 and a gamut descriptor 38". Wan further describes in column 2, lines 15 through 21, that "[t]o efficiently create the inverse look-up table, the gamut boundary needs to be determined, and a compact version of the gamut boundary will allow points outside the gamut 12 to be efficiently converted into points inside the gamut 12", and in column 3, lines 40 through 44, that states "[t]he gamut descriptor is used to produce an inverse look-up table (ILUT) which helps in mapping points or signals in a device dependent color space (DICS) to points in a device dependent color space (DDCS)." While applicant is correct in stating that Wan teaches of generating gamut descriptors, Wan further uses the generated gamut descriptors to derive an inverse look-up table, as seen in the components of Fig. 3. Because of this, one of ordinary skill in the art can interpret Wan as disclosing a method for deriving a reverse model look-up table by first deriving the gamut descriptors, which then are used to derive the inverse look-up table.

5. Therefore, the rejection of ***claim 1***, as well as ***claims 3, 5 through 8, 10, 12 through 15, 17, 19 through 22, 24, and 26 through 30***, as cited in the Office action dated 8/15/01, under 35 U.S.C. 102(e), as being anticipated by Wan *et al.* (U.S. Patent Number 5,721,572), is maintained and repeated in this Office action. Further, for the same reasons discussed above, the rejection of

claims 2, 9, 16, and 23, as cited in the Office action dated 8/15/01, under 35 U.S.C. 103(a), as being unpatentable over Wan *et al.* (U.S. Patent Number 5,721,572) in view of Spaulding *et al.* (U.S. Patent Number 5,553,199), and the rejection of ***claims 4,11, 18, and 25***, as cited in the Office action dated 8/15/01, under 35 U.S.C. 103(a), as being unpatentable over Wan *et al.* (U.S. Patent Number 5,721,572) in view of Wan *et al.* (U.S. Patent Number 5,625,378), are also maintained and repeated in this Office action.

Claim Rejections - 35 USC § 112

6. The rejection of ***claims 7, 14, 21, and 28***, as cited in the Office action dated 8/15/01, is overcome by the changes set forth in the amendment.

Claim Rejections - 35 USC § 102

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. **Claims 1, 3, 5 through 8, 10, 12 through 15, 17, 19 through 22, 24, and 26 through 30** are rejected under 35 U.S.C. 102(e) as being anticipated by Wan *et al.* (U.S. Patent Number 5,721,572, cited in the Office action dated 8/15/01).

Regarding ***claim 1***, Wan discloses a method for deriving a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors (column 3, lines 39 through 56), based on a forward model look-up table whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components (column 3, line 63 through column 4, line 28), wherein the forward model and

the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid (see Figs. 1, 2, and 7, and column 3, lines 39 through 62), the method comprising the following steps to determine an entry in the reverse model look-up table for a device independent target color (column 3, lines 39 through 56), performing a binary search of the forward model look-up table to locate a cell that contains the device independent color (column 7, lines 24 through column 24 through column 8, line 37, and column 9, lines 9 through 16), interpolating entries from the forward model look-up table at grid points that define the cell so as to obtain device dependent colors corresponding to the device independent target color (column 5, lines 43 through 67, and column 8, lines 38 through 60), and storing the device dependent color at the grid point of the reverse model look-up table for the device independent target color (column 3, lines 39 through 56).

Regarding ***claim 3***, Wan discloses the method discussed above in claim 1, and further teaches that binary searching step comprises dividing the device independent color space into multiple regions defined by device independent colors corresponding to small variations from the starting color in device dependent color space (column 6, lines 58 through column 7, line 30), determining which of the multiple regions contains the device independent target color (column 7, lines 32 through 50), and updating the starting color value based on which region contains the device independent target color (column 7, line 51 through column 8, line 41).

Regarding ***claim 5***, Wan discloses the method discussed above in claim 1, and further teaches that the device independent color space is CIEXYZ or CIELAB color space, and wherein the device dependent color space is CMY or CMYK color space (column 1, lines 32 through 58).

Regarding ***claim 6***, Wan discloses the method discussed above in claim 1, and further teaches that the forward model look-up table is derived by printing color patches corresponding to predefined colors in device dependent color space, and measuring the colors of the patches in device independent color space (column 1, line 32 through column 2, line 21).

Regarding ***claim 7***, Wan discloses the method discussed above in claim 1, and further teaches that the predefined colors are in CMY or CMYK space, and the colors are measured in CIEXYZ or CIELAB space (column 1, line 32 through column 2, line 21).

Regarding ***claim 8***, Wan discloses an apparatus for deriving a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors (column 3, lines 39 through 56), based on a forward model look-up table whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components (column 3, line 63 through column 4, line 28), wherein the forward model and the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid (see Figs. 1, 2, and 7, and column 3, lines 39 through 62), to determine an entry in the reverse model look-up table for a device independent target color (column 3, lines 39 through 56), the apparatus comprises means for performing a binary search of the forward model look-up table to locate a cell that contains the device independent color (column 7, lines 24 through column 24 through column 8, line 37, and column 9, lines 9 through 16), means for interpolating entries from the forward model look-up table at grid points that define the cell so as to obtain device dependent colors corresponding to the device independent target color (column 5, lines 43 through 67, and column 8, lines 38 through 60), and

means for storing the device dependent color at the grid point of the reverse model look-up table for the device independent target color (column 3, lines 39 through 56).

Regarding ***claim 10***, Wan discloses the apparatus discussed above in claim 8, and further teaches that the search performing means comprises means for performing iterated steps starting from a starting color value in device dependent color space (column 6, lines 58 through column 8, line 41), the iterated steps comprising dividing the device independent color space into multiple regions defined by device independent colors corresponding to small variations from the starting color in device dependent color space (column 6, lines 58 through column 7, line 30), determining which of the multiple regions contains the device independent target color (column 7, lines 32 through 50), and updating the starting color value based on which region contains the device independent target color (column 7, line 51 through column 8, line 41).

Regarding ***claim 12***, Wan discloses the apparatus discussed above in claim 8, and further teaches that the device independent color space is CIEXYZ or CIELAB color space, and wherein the device dependent color space is CMY or CMYK color space (column 1, lines 32 through 58).

Regarding ***claim 13***, Wan discloses the apparatus discussed above in claim 8, and further teaches that the forward model look-up table is derived by printing color patches corresponding to predefined colors in device dependent color space, and measuring the colors of the patches in device independent color space (column 1, line 32 through column 2, line 21).

Regarding ***claim 14***, Wan discloses the apparatus discussed above in claim 8, and further teaches that the predefined colors are in CMY or CMYK space, and the colors are measured in CIEXYZ or CIELAB space (column 1, line 32 through column 2, line 21).

Regarding ***claim 15***, Wan discloses computer-executable process steps stored on a computer-readable medium (inherent in computer 20, being a Sun Workstation or Apple Macintosh, as read in column 3, line 63 through column 4, line 32), with the process steps to derive a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors (column 3, lines 39 through 56), based on a forward model look-up table whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components (column 3, line 63 through column 4, line 28), wherein the forward model and the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid (see Figs. 1, 2, and 7, and column 3, lines 39 through 62), the process steps comprising the following codes to determine an entry in the reverse model look-up table for a device independent target color (column 3, lines 39 through 56), code to perform a binary search of the forward model look-up table to locate a cell that contains the device independent color (column 7, lines 24 through column 24 through column 8, line 37, and column 9, lines 9 through 16), code to interpolate entries from the forward model look-up table at grid points that define the cell so as to obtain device dependent colors corresponding to the device independent target color (column 5, lines 43 through 67, and column 8, lines 38 through 60), and code to store the device dependent color at the grid point of the reverse model look-up table for the device independent target color (column 3, lines 39 through 56).

Regarding ***claim 17***, Wan discloses the process steps discussed above in claim 15, and further teaches that the code to perform a binary search comprises code to perform iterated steps starting from a starting color value in device dependent color space (column 6, lines 58 through

column 8, line 41), the process steps comprising dividing the device independent color space into multiple regions defined by device independent colors corresponding to small variations from the starting color in device dependent color space (column 6, lines 58 through column 7, line 30), determining which of the multiple regions contains the device independent target color (column 7, lines 32 through 50), and updating the starting color value based on which region contains the device independent target color (column 7, line 51 through column 8, line 41).

Regarding ***claim 19***, Wan discloses the process steps discussed above in claim 15, and further teaches that the device independent color space is CIEXYZ or CIELAB color space, and wherein the device dependent color space is CMY or CMYK color space (column 1, lines 32 through 58).

Regarding ***claim 20***, Wan discloses the process steps discussed above in claim 15, and further teaches that the forward model look-up table is derived by printing color patches corresponding to predefined colors in device dependent color space, and measuring the colors of the patches in device independent color space (column 1, line 32 through column 2, line 21).

Regarding ***claim 21***, Wan discloses the process steps discussed above in claim 15, and further teaches that the predefined colors are in CMY or CMYK space, and the colors are measured in CIEXYZ or CIELAB space (column 1, line 32 through column 2, line 21).

Regarding ***claim 22***, Wan discloses a computer-readable medium (inherent in computer 20, being a Sun Workstation or Apple Macintosh, as read in column 3, line 63 through column 4, line 32) which stores computer-executable process steps, with the steps to derive a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors (column 3, lines 39 through 56), based on a forward model look-up table

whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components (column 3, line 63 through column 4, line 28), wherein the forward model and the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid (see Figs. 1, 2, and 7, and column 3, lines 39 through 62), the computer-executable process steps comprising the following steps to determine an entry in the reverse model look-up table for a device independent target color (column 3, lines 39 through 56), a step to perform a binary search of the forward model look-up table to locate a cell that contains the device independent color (column 7, lines 24 through column 24 through column 8, line 37, and column 9, lines 9 through 16), a step to interpolate entries from the forward model look-up table at grid points that define the cell so as to obtain device dependent colors corresponding to the device independent target color (column 5, lines 43 through 67, and column 8, lines 38 through 60), and a step to store the device dependent color at the grid point of the reverse model look-up table for the device independent target color (column 3, lines 39 through 56).

Regarding ***claim 24***, Wan discloses the medium discussed above in claim 22, and further teaches that the search performing step comprises iterated steps starting from a starting color value in device dependent color space (column 6, lines 58 through column 8, line 41), the process steps comprising dividing the device independent color space into multiple regions defined by device independent colors corresponding to small variations from the starting color in device dependent color space (column 6, lines 58 through column 7, line 30), determining which of the multiple regions contains the device independent target color (column 7, lines 32 through

50), and updating the starting color value based on which region contains the device independent target color (column 7, line 51 through column 8, line 41).

Regarding ***claim 26***, Wan discloses the medium discussed above in claim 22, and further teaches that the device independent color space is CIEXYZ or CIELAB color space, and wherein the device dependent color space is CMY or CMYK color space (column 1, lines 32 through 58).

Regarding ***claim 27***, Wan discloses the medium discussed above in claim 22, and further teaches that the forward model look-up table is derived by printing color patches corresponding to predefined colors in device dependent color space, and measuring the colors of the patches in device independent color space (column 1, line 32 through column 2, line 21).

Regarding ***claim 28***, Wan discloses the medium discussed above in claim 22, and further teaches that the predefined colors are in CMY or CMYK space, and the colors are measured in CIEXYZ or CIELAB space (column 1, line 32 through column 2, line 21).

Regarding ***claim 29***, Wan discloses an apparatus for deriving a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors (column 3, lines 39 through 56), based on a forward model look-up table whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components (column 3, line 63 through column 4, line 28), wherein the forward model and the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid (see Figs. 1, 2, and 7, and column 3, lines 39 through 62), the apparatus (computer 20, such as a Sun Workstation or Apple Macintosh, as read in column 3, line 63 through column 4, line 32) comprises a memory including region for storing the forward model look-up table, a region for storing the reverse model look-up table (see Fig. 3,

LUT 36 and ILUT 40), and a region for storing executable process steps (being inherent in computer 20), wherein the executable process steps include the following steps to determine an entry in the reverse model look-up table for a device independent target color (column 3, lines 39 through 56), performing a binary search of the forward model look-up table to locate a cell that contains the device independent color (column 7, lines 24 through column 24 through column 8, line 37, and column 9, lines 9 through 16), interpolating entries from the forward model look-up table at grid points that define the cell so as to obtain device dependent colors corresponding to the device independent target color (column 5, lines 43 through 67, and column 8, lines 38 through 60), and storing the device dependent color at the grid point of the reverse model look-up table for the device independent target color (column 3, lines 39 through 56).

Regarding ***claim 30***, Wan discloses the apparatus discussed above in claim 29, and further teaches that the binary search performing step comprises iterated steps starting from a starting color value in device dependent color space (column 6, lines 58 through column 8, line 41), the iterated steps comprising dividing the device independent color space into multiple regions defined by device independent colors corresponding to small variations from the starting color in device dependent color space (column 6, lines 58 through column 7, line 30), determining which of the multiple regions contains the device independent target color (column 7, lines 32 through 50), and updating the starting color value based on which region contains the device independent target color (column 7, line 51 through column 8, line 41).

Claim Rejections - 35 USC § 103

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. **Claims 2, 9, 16, and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wan *et al.* (U.S. Patent Number 5,721,572, cited in the Office action dated 8/15/01) in view of Spaulding *et al.* (U.S. Patent Number 5,553,199, cited in the Office action dated 8/15/01).

Regarding ***claims 2. 9, 16, and 23***, Wan discloses the method, apparatus, process steps, and medium discussed above in claims 1, 8, 15, and 22, respectively, but fails to specifically teach of tetrahedral interpolation. Spaulding discloses a system for deriving a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors (column 3, lines 50 through 52, and column 7, lines 39 through 50), based on a forward model look-up table whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components, wherein the forward model and the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid (see Figs. 1 through 5, and column 4, lines 36 through 49). Spaulding further teaches of interpolating that comprises tetrahedral interpolation (column 5, lines 34 through 50). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include Spaulding's teachings in Wan's system. Wan's system would easily be modified with the teachings of Spaulding, as tetrahedral interpolation is widely known and used throughout the art, as recognized by Spaulding, and since the systems share cumulative features, being additive in nature.

11. **Claims 4, 11, 18, and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wan *et al.* (U.S. Patent Number 5,721,572, hereinafter Wan'572, cited in the Office action dated 8/15/01) in view of Wan *et al.* (U.S. Patent Number 5,625,378, hereinafter Wan'378, cited in the Office action dated 8/15/01).

Regarding ***claim 4, 11, 18, and 25***, Wan'572 discloses the method, apparatus, process steps, and medium discussed above in claims 3, 10, 17, and 24, respectively, and further teaches that the determining which of the multiple regions contains the device independent target color comprises obtaining dot products for each normal plane vector that defines the multiple regions with the vector that defines the difference between the target color corresponding to the starting color (column 7, line 40 through column 8, line 41), and determines which region contains the device independent target color (column 7, line 51 through column 8, line 8). However, Wan'572 fails to specifically teach of determining which region contains the device independent target color *in accordance with which of the dot products yields positive values and which yields negative values.*

Wan'378 discloses a system for deriving a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors (column 4, lines 2 through 30), based on a forward model look-up table whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components (column 4, lines 4 through 16), wherein the forward model and the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid (see Figs. 2 and 3). Wan'378 further teaches of determining which of the multiple regions contains the device independent target color comprises obtaining dot products for each normal

plane vector that defines the multiple regions with the vector that defines the difference between the target color corresponding to the starting color (column 1, line 63 through column 2, line 34, column 4, line 50 through column 5, line 42, and column 6, lines 38 through 48), and determining which region contains the device independent target color in accordance with which of the dot products yields positive values and which yields negative values (column 6, lines 37 through 60). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the teachings of Wan'378 in the system of Wan'572. The system of Wan'572 would easily be modified with the teachings of Wan '378, as the systems share cumulative features, being additive in nature.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joe Pokrzywa whose telephone number is (703) 305-0146. The examiner can normally be reached on Monday-Friday, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward L. Coles can be reached on (703) 305-4712. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

J.R.P.
Joseph R. Pokrzywa
Examiner
Art Unit 2622

jrp
April 11, 2002

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